

66TH CONFERENCE ON EXCEPTIONAL CHILDREN

Identification and Management of Listening-Related Fatigue in Students with Hearing Loss

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SELF-ASSESSMENT: A Journey of Change

PUBLIC SCHOOLS OF NORTH CAROLINA
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Today's Goals

- Review of listening-related fatigue in children with hearing loss (CHL)
- Round-table discussions
- Subjective reports of listening-related fatigue
 - Vanderbilt Fatigue Scale-CHL
- Management techniques in the educational setting



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What is Fatigue?




- Affects several areas of life including *physical, emotional, and cognitive or mental* domains
- **Physical fatigue:** reduced ability or desire to perform some physical task
- **Cognitive/mental fatigue:** feeling of tiredness, exhaustion, or lack of energy due to cognitive or emotional demands





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“When you are hard of hearing you struggle to hear; when you struggle to hear you get tired; when you get tired you get frustrated; when you get frustrated you get bored; when you get bored you quit.” (Pichora-Fuller, 2003)



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


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Fatigue in Children with Chronic Illnesses

- Cancer
- Chronic fatigue syndrome
- Sleep deprivation
- Rheumatic diseases




(Curcio, Ferrara, & De Gennaro, 2006; Hockenberry-Eaton et al., 1999; Nagane, 2004; Ravid, Afek, Suraiya, Shahar, & Pillar, 2009a, 2009b; Stoff, Bacon, & White, 1989)

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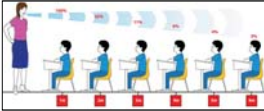
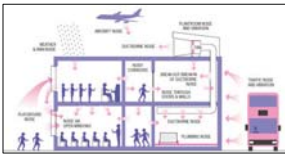
Why do we care? Consequences of Fatigue




ADULTS	CHILDREN
Report stress, inattention, concentration difficulties	Higher rates of absenteeism at school
Reduced mental processing and decision-making capabilities	Poorer school achievement
Less productive and more prone to accidents at work	Difficulties with attention, concentration, and distractibility
Less active and more isolated	More likely to fail a grade

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Listening in the Classroom

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Listening in the Classroom

- Degraded signal from effect of hearing loss and poor classroom acoustics
- Does the child put forth additional EFFORT to listen and understand in their typical listening setting? (i.e. classroom, cafeteria, gymnasium, after-school activities, etc)

CHL and AHL must increase mental effort compared to those without HL when attempting to detect, process, and respond to auditory stimuli (Hicks and Tharpe, 2002; McCoy et al., 2005)


- Increase in LISTENING EFFORT (Hornsby, 2013)

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Subjective Measures of Fatigue

- Fatigue is a common complaint among individuals with chronic health conditions (e.g. asthma, cancer)
- Several scales exist to measure multiple domains of fatigue
 - Query child, parent/guardian or service provider

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PedsQL MFS (Varni et al.)

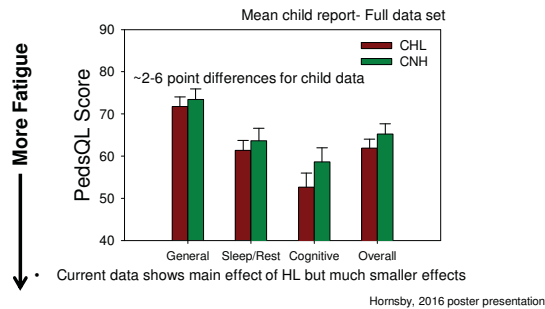
- 18 questions
- Parent and child versions
- Standardized for children age 5-18

In the past ONE month, how much of a problem has this been for you...

Fatigue Subscale	Item	Never	Almost Never	Sometimes	Often	Almost Always
General	I feel tired	0	1	2	3	4
Sleep/Rest	I sleep a lot	0	1	2	3	4
Cognitive	It is hard for me to keep my attention on things	0	1	2	3	4

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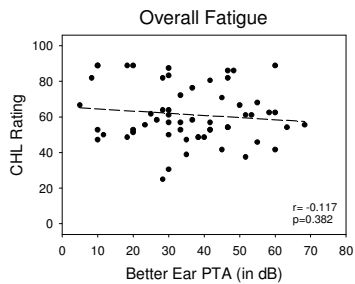
Effect of Hearing Loss



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Degree of HL Predict Fatigue?



Hornsby, 2016 poster presentation

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Vanderbilt Hearing Related Fatigue Scale (VRFS)

- 10 questions about listening and fatigue
 - Cartoon illustrations
 - Answer based on experiences in the last three months

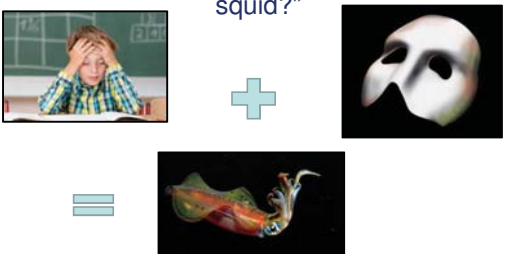
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What is fatigue?

"Fatigue sounds like phantom, so maybe a squid?"



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VFS-CHL: Phase 1

- Focus groups and individual interviews with parents, teachers, and children with hearing loss
- Transcribed and reviewed the focus group discussions
- Items written directly from quotes




SCHOOL SERVICE PROVIDER MODERATOR'S GUIDE

Does your student seem to exert more energy to participate in certain activities?

What behaviors/emotions do you note in your student that alert you that he/she may be fatigued?

What coping strategies do you/the student use to recover from fatigue?

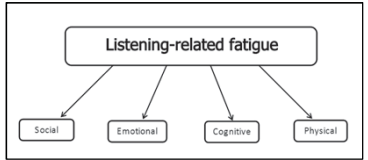
Is fatigue from listening a problem for your student?




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Roundtable Discussion

- Do you note listening-related fatigue in your students with hearing loss?
 - If so, what physical, emotional, or cognitive symptoms are observed?



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Subjective Fatigue Reports: CHL

??

It is a lot of work for me to focus on others when they are talking.

It takes a lot of work to focus on listening.

I have to try hard to focus on what others are saying.

I want to give up when I have difficulty understanding what someone is saying.

I have to focus all of my energy on listening to understand what others are saying.

I get tired trying to keep up with group conversations.

I have to focus hard to understand group conversations.

I get tired trying to process and understand in a group conversation.

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Subjective Fatigue Observations: Parents

My child complains of frequent headaches.

My child struggles to understand audio from computers.

It is difficult for my child to focus with competing background noise.

My child's hearing difficulties impact his ability to interact with others.

My child becomes tired in noisy situations.

My child gives up trying to listen in noisy places.

My child struggles to keep up with fast-paced conversation.

My child puts a lot of effort into keeping up with conversation.

My child must make an effort to keep up with fast-paced conversation.

My child gets worn out from the effort of keeping up with conversation.

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Subjective Fatigue Reports: School Professional Perspective


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Listening Effort and Amplification

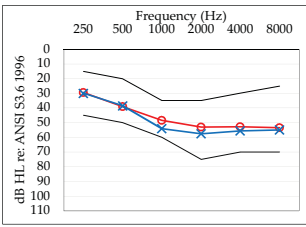
- HA Use and LE and Mental Fatigue (Hornsby, 2013)
 - Sixteen adult participants with bilateral hearing loss
 - Visual reaction time and dual-task paradigm tasks
 - Subjective reports of fatigue
 - Results:
 - Individual fatigue variability
 - Fewer participants showed substantial increases in dual-task RTs during testing when in the aided condition
- Hearing aid features
 - Directionality and DNR (Sarampalis et al, 2009)

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Listening Effort and FM

- Participants
 - 20 school-aged children with bilateral hearing loss
- Materials
 - Complex dual-task paradigm
- Conditions
 - Speaker location
 - Front
 - Back
 - Hearing aid programs
 - Omnidirectional
 - Directional
 - FM + omnidirectional

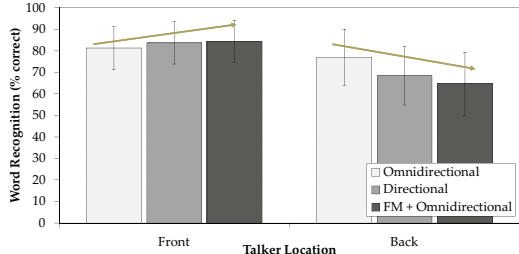


Preliminary data, Slide from Picou, 2016


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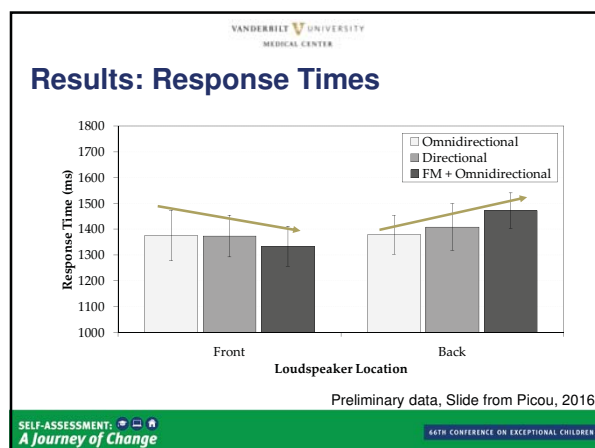
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Results: Word Recognition



Preliminary data, Slide from Picou, 2016

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Roundtable Discussion

- What does your student do to cope with listening-related fatigue?
- What are strategies the classroom teacher, SLP, deaf educator, educational audiologist, etc. can use to help the student with hearing loss dealing with fatigue in the educational setting?

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Suggestions for IEPs

ACCOMMODATIONS/MODIFICATIONS

- Provide notes ahead of class time to reduce need to multi-task during lecture/discussion
- Provide a space and/or scheduled break time for listening/quiet breaks
- Consider schedule of day and timing of auditory tasks, including therapies or other pull-out sessions
- Consistent personal amplification and FM system use
- Preferential seating to reduce listening effort
- Visual information available in the classroom
- Classroom acoustic modifications

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Questions? Thoughts?



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Visit the Listening and Learning Lab's website at
<http://my.vanderbilt.edu/listeninglearninglab>
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